



State of Washington
DEPARTMENT OF HEALTH
Office of Environmental Health Assessments
P.O. Box 47846
Olympia WA 98504-7846

**To report a hazardous
substance release,
please call the Washington
State Department of
Emergency Management
1-800-258-5990**

Sources: Hills Brothers Chemical Company available at <http://puyallupfire.com/lepc/chlorine.htm>; New Jersey HSEES program.

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HAZARDOUS SUBSTANCES EMERGENCY EVENTS SURVEILLANCE

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BLEACH FACT SHEET

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**NEVER mix bleach
with common household
cleaning products**

Mixing bleach with common household cleaning products can cause serious injuries. This fact sheet describes some of the hazards of mixing chlorine bleach and other common household cleaning products, and a few of the possible health effects. Be sure to always read the product labels before using household or institutional cleaning products.



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HEALTHIER WASHINGTON

WHAT IS CHLORINE BLEACH

Sodium Hypochlorite is the active ingredient in chlorine bleach. It is found in household bleach and many other disinfectants. Sodium hypochlorite reacts with ammonia, drain cleaners, and other acids. Many household products state that they contain bleach on the label.

DANGERS OF MIXING CLEANING PRODUCTS

Mixing Bleach and Ammonia

When bleach is mixed with ammonia, toxic gases called *chloramines* are produced. Exposure to chloramines gases can produce the following symptoms:

- Coughing
- Shortness of breath
- Chest pain
- Wheezing
- Nausea
- Watery eyes
- Irritation to the throat, nose and eyes
- Pneumonia and fluid in the lungs

In 1994, a noxious gas was created when bleach and ammonia were mixed at a treatment facility. Two patients and two facility employees sustained respiratory irritation. All were treated at a local hospital and released.

Mixing Bleach and Acids

When chlorine bleach is mixed with an acid, *chlorine gas* is given off. Chlorine gas and water combine to make hydrochloric and hypochlorous acids.

Chlorine gas exposure, even at low levels and short periods of time, almost always irritates the mucous membranes (eyes, throat, and nose), and causes coughing and breathing problems, burning and watery eyes, and a runny nose. Higher levels of exposure can cause chest pain, more severe breathing difficulties, vomiting, pneumonia, and fluid in the lungs. Very high levels can cause death. Chlorine can be absorbed through the skin, resulting in pain, inflammation, swelling, and blistering. Hydrochloric acid also causes burns to the skin, eyes, nose, throat, mouth, and lungs.

In 2003, an employee was exposed to chlorine fumes when bleach was poured into a plumbing fixture and not thoroughly rinsed out before adding drain cleaner. The employee was treated at a local hospital and released.

Mixing Bleach with Other Cleaning Products

Bleach also reacts with some oven cleaners, hydrogen peroxide, and some insecticides. Pool chemicals frequently contain calcium hypochlorite or sodium hypochlorite and should not be mixed with other cleaning products.

WHERE AMMONIA AND ACIDS ARE FOUND

Ammonia

In addition to using ammonia as a cleaning product, ammonia may be found in the following:

- Some glass and window cleaners.
- Some interior and exterior paints.
- Urine (use caution when cleaning litter boxes, diaper pails or toilet bowls).

Acids

Products containing acids include:

- Vinegar.
- Some glass and window cleaners.
- Some automatic dishwasher detergents and rinses.
- Some toilet bowl cleaners.
- Some drain cleaners.
- Some lime, calcium and rust removal products.
- Some brick and concrete cleaners.

HEALTH EFFECTS

Health Effects Associated with Exposure to Various Levels of Chlorine in the Air The odor threshold of chlorine is 0.2 ppm. However, the odor threshold is not an adequate warning sign for overexposure to chlorine since once an individual is exposed, the sense of smell rapidly loses its ability to detect changes in levels which can unknowingly lead to over exposure. The hazard at different concentrations is reported below.	
Chlorine Concentration (ppm)	Effect on Health
0.2–0.5	No toxic long-term effect.
1–3	Definite odor; irritation of eyes and nose.
5–8	Throat, eye, and mucous membrane irritation.
30	Intense coughing fits.
34–51	Lethal in 1 to 1.5 hours exposure.
40–60	Exposure for 30–60 minutes without effective respiration may cause bronchitis, pulmonary edema or bronchopneumonia.
100	May be lethal after an estimated 50 minutes of exposure.
430	Lowest estimated lethal concentration known to be fatal after 30 minutes of exposure.
1000	May be fatal with a few deep breaths.

This fact sheet summarizes information about chlorine bleach and is not a complete listing of all possible effects.

